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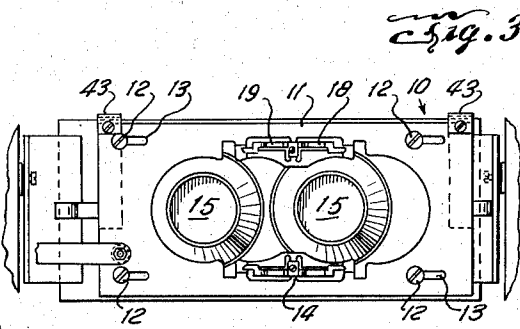
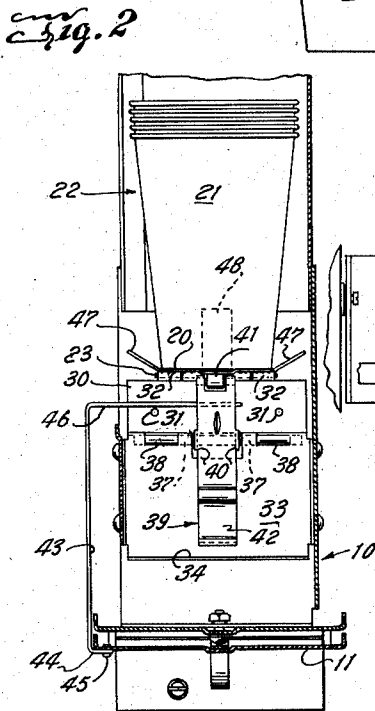
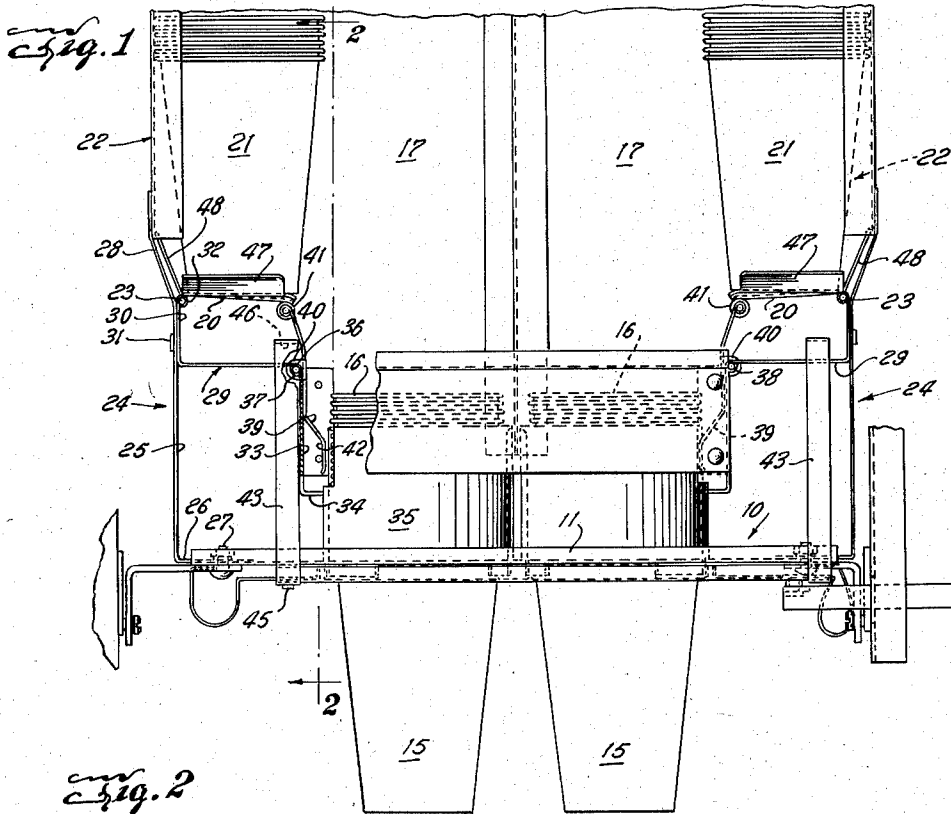
J. J. BOOTH ET AL

2,869,754

AUTOMATIC REPLENISHING DEVICE FOR CUP DISPENSERS

Filed Jan. 9, 1956

2 Sheets-Sheet 1



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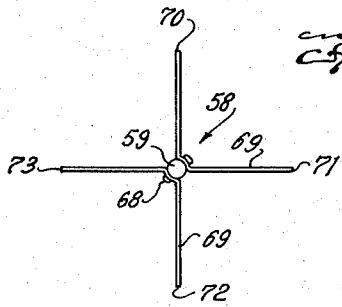
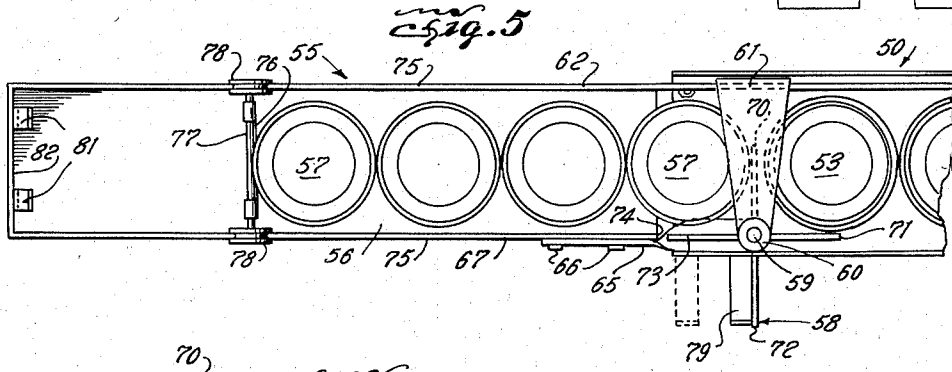
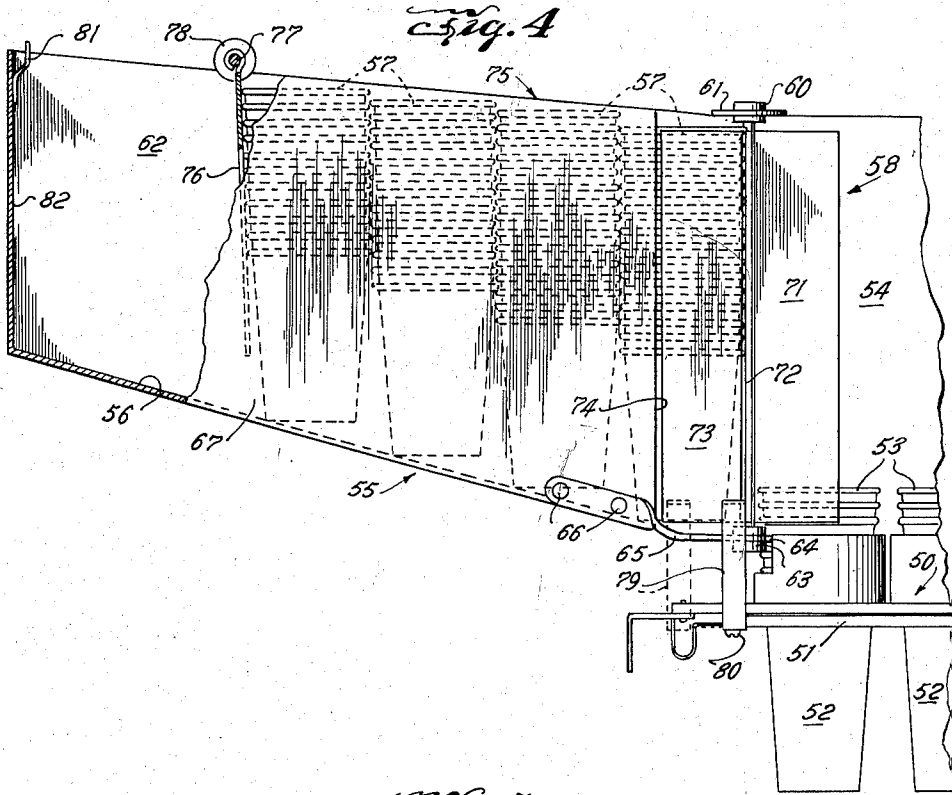
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AUTOMATIC REPLENISHING DEVICE FOR CUP DISPENSERS

Jack J. Booth and William C. Branch, Dallas, Tex.

Application January 9, 1956, Serial No. 558,026

9 Claims. (Cl. 221—11)

This invention relates to paper cup dispensers and more particularly to such dispensers as employed in coin actuated beverage vending machines.

The principal object of the invention is to provide, in a cup dispenser, a cup storage magazine on one or both sides of a dual cup dispenser wherein a reciprocating slide releases cups alternately from vertically disposed, parallel dispensing magazines, such as described in my co-pending application, Serial No. 230,779, filed June 9, 1951, now Patent No. 2,747,782. Moreover, the invention anticipates mechanism adapted to prohibit interference between the cups in the storage compartments or magazines with those in the active or dispensing magazines to insure free and unrestricted release of cups by the dispensing mechanism at all times.

Other objects will appear as the description proceeds when considered with the annexed drawing, wherein:

Fig. 1 is a side elevational view of a paper cup dispenser showing the relationship therewith of the improved cup replenishing mechanism of the invention.

Fig. 2 is a vertical sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a bottom plan view of a conventional cup dispenser.

Fig. 4 is a side elevational view of a modified form of the cup replenishing mechanism.

Fig. 5 is a top plan view of Fig. 4, and

Fig. 6 is a top plan view of a bladed cup restraining element adapted to withhold cups in the storage compartment while there are still cups in the dispensing magazine.

In beverage vending machines wherein the beverage is automatically released into cups individually dropped into receiving position by a dispensing mechanism coordinated with the coin actuated beverage vending mechanism, there has long been a need for a reliable mechanism for replenishing the depleted cup dispensing magazines. Attempts have heretofore been made to accomplish the foregoing but such mechanisms as are known have proven impractical in that freedom of movement of the column of cups in the dispensing magazine is interfered with by the replenishing mechanism of the storage magazine or compartment. The inadequacies of such mechanisms obviously reduce the efficiency of the otherwise able performance of beverage vending machines with which they are designed to function.

Continuing with a more detailed description of the drawing, reference is more primarily to Figs. 1 and 2 wherein numeral 10 designates generally a cup dispenser such as described in the co-pending application identified above. This dispenser consists essentially of a slide 11 which is supported on the dispenser 10 by means of screws 12 (Fig. 3) extending through longitudinal slots 13 in the slide, thus to enable the slide to reciprocate longitudinally. An elongate opening 14

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in the slide 11 accommodates the bottom cups 15 of the two parallel columns of cups 16 in the dispensing magazines, generally indicated in Fig. 1 by reference numeral 17. As the slide 11 moves to the right, as viewed in Fig. 3, a kicker spring 18 engages under the lip of the lowest cup 15, releasing the same from the bottom of its column 16 to take its position in the machine for filling. At the end of the reverse travel of the slide 11, a second kicker spring 19 engages the lip of the lowest cup of the companion column 16, releasing this cup in like manner.

It is not deemed necessary to burden this description with a detailed description of the cup dispenser since the latter is clearly shown and described in the aforementioned application. It is considered that this above brief explanation of the function of the cup dispenser will be sufficient to reveal the relationship between this cup dispenser and the present invention, the description of which follows.

The cup replenishing mechanism of the invention includes a platform 20 on which is adapted to rest a column of cups 21 in a storage magazine or compartment 22 at the left of the dispensing or delivery magazines 17, as they may sometimes be called. The platform 20 is hinged by means of a horizontal pin 23, to a supporting bracket, generally indicated by reference numeral 24 and which is composed of a plate 25, whose lower edge 26 is turned inwardly toward the dispenser 10 and is secured thereto by a bolt 27. The upper edge 28 of the plate 25 is bent outwardly and upwardly and is secured to the lower portion of the storage magazine 22. A second plate 29 has an upturned portion 30 secured to the vertical portion of the plate 25 by means of rivets 31. A pair of horizontally spaced ferrules 32 are formed on the upper edge of the upturned portion 30 of the plate 29 to receive the pin 23 about which the platform 20 rotates. The plate 29 has a depending portion 33 whose lower edge 34 is bent at right angles to bear against one of the cylindrical retainers 35 of the cup dispenser 10, as shown in Fig. 1.

At the bend 36 between the horizontal portion of the plate 29 and the vertical portion 33 thereof, a pair of horizontal, spaced apart ferrules 37 (Fig. 2) are formed to accommodate a horizontal shaft 38. Mounted for oscillation about the shaft 38 is a strap 39 which will be referred to hereinafter as the "trigger support" inasmuch as it supports the platform 20 and triggers the same to collapsed position when the cups in the left hand magazine 17 are depleted. To connect the trigger support 39 to the shaft 38, a pair of ears 40 is formed, one on each side thereof. These ears are provided with matching holes to receive the shaft 38, as shown. The upper end of the trigger support 39 carries a roller 41 which, in operative position of the trigger, rests under the edge of the platform 20 opposite the hinged edge thereof.

The lower end of the trigger 39 is turned outwardly and downwardly as at 42 and normally bears against the combined lips of the several cups in the column 16 adjacent the bottom of the column. The presence of these cups prevents the trigger 39 from turning on the shaft 38 and releasing the platform 20.

In order to prevent frictional engagement of the portion 42 of the trigger 39, combined with the weight of the column of cups 21 from holding the cups in the adjacent column 16 against downward movement in the dispenser 10, it is necessary to relieve this friction each time the dispenser 10 is actuated to release a cup 15. This is accomplished by an upstanding arm 43 whose lower end 44 (Fig. 2) is secured to one side of the slide 11 by a rivet or screw 45. The upper portion 46 of the arm 43 is turned inwardly at right angles and is adapted to be

brought up against the trigger 39 each time the slide 11 of the dispenser moves to the right. When this occurs the upper portion of the trigger 39 above its pivotal shaft 38 will be moved slightly outward to cause its lower cup engaging portion 42 to move away from the cups in the adjacent column 16, freeing them for downward displacement as a cup is dropped from the bottom thereof. After the cup is dispensed, the arm 43 relaxes its pressure against the trigger 39 and the latter returns to its position against the column of cups 16, which holds the trigger in position to support the cups 21 in storage. At no time is the replenishing mechanism affected by the dispensing of cups, the platform 20 remaining in support of the cups 21 in storage until all but the last 5 or 6 cups are left in the adjacent delivery magazine 17.

When all but the aforesaid 5 or 6 cups have been dispensed from the adjacent delivery magazine 17, nothing remains to support the portion 42 of the trigger 39, hence the latter pivots about the shaft 38, the roller 41 at its upper end moving toward the pivot point 23 of the platform 20. Since the trigger now no longer supports the platform 20, the latter collapses, permitting the column of cups 21 to slide downwardly and into the uppermost cups of those remaining in the dispenser. As the column of cups from storage move into the described position for dispensing, they contact the portion 42 of the trigger 39, moving it downwardly while causing the upper end thereof to move forwardly, thereby restoring the platform 20 to its operative position to receive another column of cups, the lower portion 42 of the trigger meanwhile resuming its position against the column of cups deposited into the dispenser.

The platform 20 has angularly disposed wings 47, one on each side to facilitate centering of the cups 21 thereon and is further provided with an angularly extending finger 48 rearwardly thereof which is effective to kick the cups in the direction of tilt of the platform when the latter is released, as explained.

The drawing shows a dual cup dispenser, hence a dual replenishing mechanism is required. The replenishing mechanism shown at the right in Fig. 1 is an identical duplicate of that shown at the left of the figure, hence identical numerals are employed to identify corresponding parts in the two replenishing mechanisms.

Referring now to Figs. 4, 5 and 6, showing a modification of the replenishing mechanism just described, numeral 50 denotes generally the cup dispensing mechanism of the type referred to in the co-pending application Serial No. 230,779, filed June 9, 1951, now Patent No. 2,747,782. This dispenser consists essentially of the reciprocable slide 51 which is shifted from side to side as the vending mechanism of a vending machine is operated, to release cups 52 alternately from the bottoms of the parallel columns of cups 53 in the dispensing or delivery magazine or compartment 54.

Supported adjacent the dispensing mechanism 50 is a chute generally indicated by reference numeral 55 which will be referred to from time to time as the cup storage magazine or compartment. This magazine 55 has an inclined bottom or slide 56 which supports a plurality of stacks or columns of cups 57 in such manner that these columns are moved successively into stacked relationship with the remaining cups in respective delivery magazines 54 when the cups 53 therein are almost depleted. The lowest point of the inclined bottom 56 is elevated slightly above the dispenser 50 or a distance equal to the height of a reduced column of about 5 or 6 cups remaining in the dispenser. This insures that the dispensing magazine will be replenished before all of the cups have been dispensed.

To control the passage of columns of cups from the storage to the dispensing magazine, a rotary cup restraining member is provided and is generally indicated by reference numeral 58 and is shown per se in Fig. 6. This member 58 is comprised of a vertical shaft 59 whose

upper end is journaled in a bearing 60 which latter is mounted on the near end of a supporting bracket or arm 61, the latter being affixed at its far or rear end to a rear wall plate 62 of the storage magazine 55. The lower end of the vertical shaft 63 (Fig. 4) is supported by an end 64 of a metal strap or bracket 65, the opposite end of the latter being secured, as by bolts or rivets 66 to the lower edge of the front wall 67 of the storage magazine 55.

The shaft 59 has attached thereto, as by welding or rivets 68 (Fig. 6), a pair of substantially V-shaped plates 69, the angles of those plates being formed to the shaft. Thus are provided four radial blades 70, 71, 72 and 73 which are spaced apart 90°.

The front wall 67 of the storage magazine 55 is shorter than the parallel rear wall 62 to define a vertical space 74, to accommodate the blades of the cup restraining member 58 whose lower end is spaced sufficiently above the dispenser 50 as to clear a reduced column of approximately 5 or 6 cups remaining in the dispensing magazine 54.

The top edges 75 of the parallel walls 62 and 67 are inclined on a flush plane but the degree of incline is less than that of the floor or bottom 56 of the storage magazine, down which the columns of cups 57 slide. To propel the columns of cups down the inclined floor of the chute, a weight in the form of a swinging plate 76 is suspended from a cross-member or transverse shaft 77 extending from one wall 62 to the other wall 67 and has its ends journaled in grooved rollers 78 adapted to engage the upper edges of the walls 62 and 67 and travel by gravity thereon in the direction of the dispensing magazines 54.

The cup restraining member 58 is mounted for free rotation in its bearings 60 and 63 but is held against such rotation by an upstanding arm 79 whose lower end is secured, as by a bolt 80 (Fig. 4) to one side of the slide 51 of the cup dispenser 50. As shown, one blade 70 of the restraining member 58 is disposed between the lowest column of cups 57 in the storage magazine 55 and the adjacent column of cups 53 in the dispensing magazine 54. Until the highest cup in the column of cups in the dispensing magazine 54 moves below the lower end of the cup restraining member 58, the latter cannot turn, first, because of the presence of the cups in the dispensing magazine but actually because of the fact that the blade 72 of the restraining member 58, in the position shown, is engaged by the release arm 79 which is actuated by the dispensing mechanism.

Each time a cup is dispensed from the bottom of the column of cups in the dispenser 50, the release arm 79 will move into the solid line position shown. The arm will engage the blade 72, causing a slight counter clockwise movement of the restraining member 58. This action will cause the opposite blade 70 of the member 58 to move away from the adjacent column of cups 53, relieving pressure thereon so that the cups will pass freely downward in the dispenser and will not be suspended by the restraining member 58.

When there are but 5 or 6 cups remaining in the adjacent dispensing magazine 54, there is nothing to prevent the restraining member 58 from rotating, since the release arm 79 will have moved to the dotted position shown. This being true, the first column of cups in the storage magazine 55 will move, partly by gravity and partly by the pressure of the "pusher" plate 76, into the delivery magazine 54 and will be deposited into the uppermost of the remaining cups in the magazine 54. As this action takes place the blade 70 of the restraining member 58 will assume the position shown to be occupied by the blade 71 while the latter will move into the position of blade 72 and the blade 73 will now repose between the released column and the next succeeding column of cups in the storage magazine 55, thus to restrain the said next succeeding column in the manner earlier described. This operation is repeated auto-

matically until all of the columns of cups 57 have been discharged from the storage magazine 55.

The empty space in the storage magazine 55 created by the successive discharge of columns of cups into the delivery magazine 54 may be filled at any time by additional columns of cups by moving the "pusher" plate 76 rearwardly and placing its shaft 77 into the retaining hooks 81, affixed to the end wall 82 of the storage magazine 55. The columns of cups are usually packed in containers from which the cups are deposited directly into the storage magazine without need for handling them.

It is evident from the foregoing that the column of cups 53 in the delivery magazine 54 is never under restraint by frictional contact therewith of the blades of the restraining member 58 during any dispensing operation since the release arm 79 will always be brought up against the outwardly extending blade of the member 58 during each dispensing action to move the member 58 in a counter clock-wise direction a distance sufficient only to cause the diametrically opposite blade of the member 58 to withdraw from the active column of cups in the delivery magazine 54 and thereby relieve friction thereon.

Manifestly, the construction as shown and described is capable of some modification and such modification as may be construed to fall within the scope and meaning of the appended claims is also considered to be within the spirit and intent of the invention.

What is claimed is:

1. In combination with a cup dispenser having a horizontally reciprocable cup release slide, a cup replenishing mechanism comprising a cup delivery magazine containing a column of cups from which cups are singly released by said slide, a cup storage magazine adjacent said delivery magazine containing a column of cups, restraining means normally in frictional contact with the column of cups in said delivery magazine and restraining the column of cups in said storage magazine and means carried by said reciprocable slide adapted to engage said restraining means during each cup releasing action of said slide to move the same out of frictional contact with the column of cups in said delivery magazine, said restraining means being ineffective to restrain the column of cups in said storage magazine when the height of the column of cups in said delivery magazine recedes below a predetermined level.

2. In combination with a paper cup dispenser having a reciprocable slide adapted to release cups alternately from parallel columns of cups in a delivery magazine, a cup replenishing device comprising a storage magazine in which a column of cups is disposed for release into said delivery magazine, restraining means in frictional contact with an adjacent column of cups in said delivery magazine and held thereby in operative position to restrain said column of cups in said storage magazine, said restraining means being ineffective to restrain said column of cups in said storage magazine when the height of the column of cups in said delivery magazine recedes to a predetermined level and means carried by said dispenser slide for relieving frictional contact between said restraining means and the column of cups in said delivery magazine during each dispensing action of said slide.

3. In combination with a paper cup dispenser having a cup release slide, a delivery magazine containing a stack of cups, from the bottom of which cups are successively released by said slide, a storage magazine in which a stack of cups is disposed to replenish said delivery magazine, means holding said stack of cups in said storage magazine while the height of the stack of cups in said delivery magazine is above the lowest cup in the stack in said storage magazine, means normally engaging the stack of cups in said delivery magazine for restraining said holding means until the stack of cups in said delivery magazine recedes below the lowest cup in the stack of

cups in said storage magazine and means carried by said slide for disengaging said restraining means from the stack of cups in said delivery magazine during each dispensing cycle of said dispenser to free said latter stack of cups for downward movement.

4. A cup replenisher for a cup dispenser comprising a delivery magazine from which cups are released from the bottom of a stack in said delivery magazine by said dispenser, a storage magazine from which stacks of cups are released successively into said delivery magazine to replenish the latter, restraining means maintained in an operative position by engagement with cups in said delivery magazine for restraining cups in said storage magazine and becoming ineffective to restrain the latter cups when the stack of cups in said delivery magazine recedes below a predetermined height and means actuated by said dispenser for disengaging said restraining means from the stack of cups in said delivery magazine to free the same for downward movement in said dispenser.

5. A cup replenisher for a cup dispenser comprising a cup delivery magazine above the dispenser from which cups are released by the dispenser from a stack of cups in the delivery magazine, a cup storage magazine from which stacks of cups are deposited successively into the delivery magazine to replenish it, and means normally in contact with and supported by the stack of cups in the delivery magazine for restraining an adjacent stack of cups in the storage magazine, the restraining means releasing the adjacent stack of cups in the storage magazine upon depletion of the supply of cups in the delivery magazine, the restraining means including a platform on which the adjacent stack of cups in the storage magazine is disposed, the platform being pivotally supported on one side and having a trigger support on its opposite side, the platform being inclined downwardly in the direction of the delivery magazine upon disengaging the trigger support therefrom and having an upstanding angular finger on the side thereof opposite the trigger support capable of acting as a kicker to urge the stack of cups disposed thereon in the direction of the delivery magazine, the trigger support including a bent metal strap, pivotally supported intermediate its ends and rotatable about a horizontal axis, and a roller carried by one end of the strap and bearing against the under side of the platform, the opposite end of the strap normally engaging the sides of the stack of cups in the delivery magazine and being maintained in engagement therewith by the weight of the stack of cups on the platform, acting on the adjacent end of the strap.

6. In apparatus as described in claim 5, means carried by the dispenser for moving the restraining means out of contact with the stack of cups in the delivery magazine during each operating cycle of the dispenser to thereby free the stack of cups for downward movement.

7. In a cup replenisher for a cup dispenser comprising a cup delivery magazine above the dispenser from which cups are released by the dispenser from a stack of cups in the delivery magazine, a cup storage magazine from which stacks of cups are deposited successively, by gravity, into the delivery magazine to replenish it, and means normally in contact with and supported by the stack of cups in the delivery magazine, and maintained in engagement therewith by the weight of an adjacent stack of cups in the storage magazine, for restraining the adjacent stack of cups in the storage magazine against movement by gravity toward the delivery magazine, the restraining means releasing the adjacent stack of cups in the storage magazine upon depletion of the supply of cups in the delivery magazine, means carried by the dispenser for moving the restraining means out of contact with the stack of cups in the delivery magazine during each operating cycle of the dispenser to thereby free the stack of cups for downward movement.

8. A cup replenisher for a cup dispenser comprising a

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cup delivery magazine above the dispenser from which cups are released by the dispenser from a stack of cups in the delivery magazine, a cup storage magazine from which stacks of cups are deposited successively, by gravity, into the delivery magazine to replenish it, and means normally in contact with and supported by the stack of cups in the delivery magazine, and maintained in engagement therewith by the weight of an adjacent stack of cups in the storage magazine, for restraining the adjacent stack of cups in the storage magazine against movement by gravity toward the delivery magazine, the restraining means releasing the adjacent stack of cups in the storage magazine upon depletion of the supply of cups in the delivery magazine, the restraining means including a platform on which a stack of cups in the storage magazine is disposed, the platform being pivotally supported on one side and having a trigger support on its opposite side, the platform being inclined downwardly in the direction of the delivery magazine upon disengaging the trigger support therefrom, the trigger support including a bent metal strap, pivotally supported intermediate its ends and rotatable about a horizontal axis, one end of the strap bearing against the under side of the platform, the opposite end of the strap normally engaging the sides of the stack of cups in the delivery magazine and being maintained in engagement therewith by the

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weight of the stack of cups on the platform, acting on the adjacent end of the strap.

9. In a cup replenisher for a cup dispenser comprising a cup delivery magazine feeding the dispenser, a cup storage magazine feeding the delivery magazine, and means normally engaging a stack of cups in the delivery magazine, and maintained in engagement therewith by pressure applied thereto by an adjacent stack of cups in the storage magazine, operative to restrain the adjacent stack of cups in the storage magazine against movement toward the delivery magazine, the restraining means being ineffective to prevent the movement of cups from the storage magazine to the delivery magazine when the delivery magazine is substantially depleted, means operated by the dispenser for disengaging the restraining means from the stack of cups in the delivery magazine to thereby free the stack of cups for unrestricted downward movement when the dispenser is actuated to release a cup from the stack of cups.

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